Table 14.1. Estimated drought frequencies for maize, and levels of agronomic risk for maize and forage grasses, for four categories of land in central Mexico.

Category*	Drought in maize		Level of agronomic risk	
	Frequency (% of years)	Intensity**	Maize and similar crops	Forage grasses
A. Irrigated land and rainfed areas with more than 900 mm of annual rainfall	0-10 % 0-20 %	severe moderate	Low	Very low
B. Rainfed areas with 750-900 mm of annual rainfall	10-20 % 20-35 %	severe moderate	Moderate	Low
C. Rainfed areas with 600-750 mm of annual rainfall	20-40 % 35-40 %	severe moderate	High	Moderate
D. Rainfed areas with less than 600 mm of annual rainfall	>40 % remainder	severe moderate	Very High	High

* These categories are defined for deep soils (medium and heavy soils more than 50 cm in depth; light soils more than 75 cm in depth). In general, with a given amount of rainfall, the effect of drought is inversely proportional to the altitude.

** Severe drought is arbitrarily defined as drought that reduces the potential yield by 60% or more; moderate drought as that which reduces the potential yield by 30 to 60%.

gram strategy should place major stress on local research during the first year or so, and later on technical assistance with emphasis on work with farmer groups.

Category C of the same table includes rainfed areas receiving 600-750 mm of precipitation annually. In a 10-year period, the expected frequency of severe drought in maize is 2 to 4 years, with moderate drought in about 4 additional years. Farmers who grow maize in Category C regions assume a *high* level of risk.

Present indications are that average maize yields in a Category C region can be increased relatively little, perhaps by no more than 50-75 percent. Thus, agronomic research should give special attention to improved production of other species, such as beans, sorghum, millets, and forage grasses. Research on maize should emphasize the breeding of drought-tolerant varieties and the use of moisture conservation practices (early fall plowing, planting on contour, mulches, low plant densities, wide row spacings, weed control, etc.). Research on animal production also should assume greater importance. Applied research in Category C areas will require relatively more resources for a longer period of time than in Category B areas. Hopefully, however, much of the research findings will be applicable in similar areas with little additional testing.

Technical assistance in a Category C area will probably have little importance during the first few years while technological packages are being developed through local research. During these years, the principal effort should be devoted to explaining the nature of the program, organizing the farmers into groups, and preparing them to accept new practices once they have been defined. Afterwards the resources devoted to technical assistance will be similar to those in a Category B area.

Category D consists of rainfed areas receiving less than 600 mm of precipitation annually. Maize can be expected to suffer moderate or severe drought damage every year. The level of risk in growing maize is too high to permit the use of costly inputs such as fertilizers. Agronomic research should be concentrated on forage crops for animal production. Major emphasis should be placed on increasing net income and employment through non-agricultural activities such as cottage industries, arts and crafts, public works, etc.

It seems reasonable to assume that agricultural areas in other parts of Mexico and other countries can be grouped into four similar categories. The amounts of rainfall or levels of other ecological variables that mark the limits between the several categories will have to be determined locally.

The Puebla approach seems to be applicable in regions corresponding to the four categories, but is not essential for Category A areas. It is expected that strategies used in programs within a given category will be similar, but may vary greatly among programs in different categories.